Icetop test requirements

- Strategy: Build on the success of In Ice development
- What is different ?
  - DOMs: High & Low Gain
    - MB, Firmware, Software, Communication
  - DOM Hub: Communication speed, RAPcal
  - DAQ: data flow and functionality
  - Ice: tank quality
  - Environment: Thermal, EM noise?
  - Physics events

DOM

- High Gain –
  - HW similar to in ice DOM
  - Firmware – two types of trigger, FX, Coincidence

- Low Gain – different
  - Different PMT? or diff HV, dynode pickoff…
  - dynamic range
  - muon calibration, overlap dynamic range with HG

- Common
  - communication speed
  - thermal
  - EM noise
  - RAP differences (noise, pulse shape on short cable)
  - 1 DOM vs 2 DOM Control

DOM Hub

- Communication Speed

- RAP

- Control 1 DOM per wire

- Forwarding algorithms may differ with DAQ

DAQ

- Independent functionality (through IceTop Trigger)
- Full DAQ functionality (including GT tests)
- Satisfy worst case network and processing load

Ice tanks

- ## Calibrate tank response

  – ice scattering/transparency/cracks?

  – liner

  – coupling ice to DOM

  – full tank response

    - photon efficiency

    - time response of tank

  – light sources

    - LED

    - muons (muon lunchbox)

Environment

- ## Temperature
  - external varies from –15C to –75C
  - Monitor T
  - Control
  - T effect on response of Tanks/PMT/ATWD…
  - T effect on RAP?

- ## EM Noise
  - commuication
  - RAP
  - single pe sensitivity